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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/916,791	07/26/2001	William A. Fuglevand	AV1-024	8786

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EXAMINER

KALAFUT, STEPHEN J

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 06/23/2003

3

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/916,791

Applicant(s)

FUGLEVAND, WILLIAM A.

Examiner

Stephen J. Kalafut

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7-14, 24-31 and 39-47 is/are allowed.
- 6) ☒ Claim(s) 1-6, 15-23 and 32-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other: _____

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Claims 1-6, 15-23 and 32-38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term “substantially similar” in claims 1, 15, 19 and 32 is a relative term which renders the claim indefinite. The term “substantially similar voltage” is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The degree of difference between the optimal fuel cell voltage and the nominal energy storage device voltage which would be tolerable within this term is unclear.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 6, 19, 23, 32, 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamada *et al.* (US 4,670,702).

Yamada *et al.* disclose a system which includes a fuel cell (1), which would inherently have an optimal voltage, an energy storage device (4) in the form of a battery, and an electrical switch (Th₂) through which the fuel cell may charge the battery. Since the fuel cell is powerful

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enough to charge the battery, its optimal voltage and the nominal battery voltage would be substantially similar, to the extent that the term is understood. A controller (6) monitors the voltages of the battery and the fuel cell, and controls the switch (column 3, lines 2-10). This charging of the battery would prevent its voltage from degrading, and thus keep it above a threshold, as in claim 19. The operation of the switch would be “selectively electrically coupling” the fuel cell and the battery, as in claim 32. Regarding claims 6 and 23, there are no power conditioning or conversion devices between the battery and the fuel cell.

Claims 1, 6, 19, 23, 32, 34-36 are rejected under 35 U.S.C. 102(a) and (e) as being anticipated by Iwase (US 6,255,008).

Iwase discloses a system which includes a fuel cell (36), which would inherently have an optimal voltage, an energy storage device (40) in the form of a battery, and an electrical switch (41) through which the fuel cell may charge the battery. Since the fuel cell is powerful enough to charge the battery, its optimal voltage and the nominal battery voltage would be substantially similar, to the extent that the term is understood. A controller (20) monitors the voltages of the battery and the fuel cell (column 4, lines 38-50, column 6, lines 13-20) using sensors (22, 42) connected to the controller, and controls the switch (column 5, lines 57-59). This charging of the battery would prevent its voltage from degrading, and thus keep it above a threshold, as in claim 19. The operation of the switch would be “selectively electrically coupling” the fuel cell and the battery, as in claim 32. Regarding claims 6 and 23, while there is a DC/DC converter between the fuel cell and the battery, it is sometimes bypassed via another switch (37). When the

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converter is not bypassed, it would connect the battery to a load, which is a motor (46), as in claim 35.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 and 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over either Yamada *et al.* or Iwase, both above.

Claim 2 differs from Yamada *et al.* and Iwase by reciting a plurality of fuel cells. Since the amount of energy produced by fuel cells varies with the amount thereof, the ordinary artisan would be motivated to use multiple fuel cells to produce a desired amount of energy to charge the energy storage device. Claim 20 differs from Yamada *et al.* and Iwase by reciting a plurality of batteries as the energy storage device. However, since the amounts of current and voltage, and thus the amount of energy which may be stored or released by a battery system varies directly with the number of cells connected together, the use of multiple batteries to increase the energy storage capacity within the systems of either Yamada *et al.* or Iwase would be obvious to the ordinary artisan. These claims would thus be obvious over either Yamada *et al.* or Iwase.

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Claims 7-14, 24-31 and 39-47 are allowed. The prior art, either above or cited below or by applicant, does not disclose a system including an energy storage device and a plurality of fuel cells, where a variable number of fuel cells may be connected to charge the storage device.

Claims 15-18 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action. These claims also recite the variable number of fuel cells which may be connected to charge an energy storage device.

Claims 3-5, 21, 22, 33, 37, 38 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. The multiple removable subracks, each supporting a fuel cell, a subrack in combination with a DC bus, a capacitor as the energy storage device, and multiple independent fuel cells, where one may become inoperative while allowing the rest to continue operation, are not taught by the prior art as obvious additions to the fuel cell systems of Yamada *et al.* or Iwase.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Baker *et al.* (US 4,000,003), Tajima *et al.* (US 5,334,463), Hauer (US 6,214,484) and King *et al.* (US 6,326,763) disclose systems which include both a fuel cell and a battery. Applicant's prior art statements have been reviewed. Some references were crossed out on some of the 1449 forms because of duplicate citations therein.

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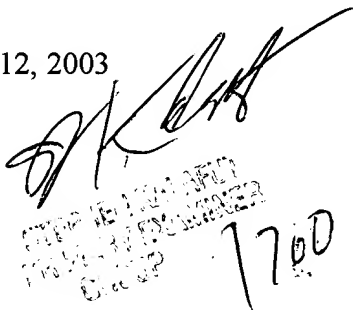
The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J. Kalafut whose telephone number is (703) 308-0433. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (703) 308-2383. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

sjk
June 12, 2003

A handwritten signature in black ink is written over a rectangular official stamp. The stamp contains the text "STEPHEN J. KALAFUT" and "Patented by the Office of the Commissioner of Patents". To the right of the stamp, the number "1745" is handwritten.